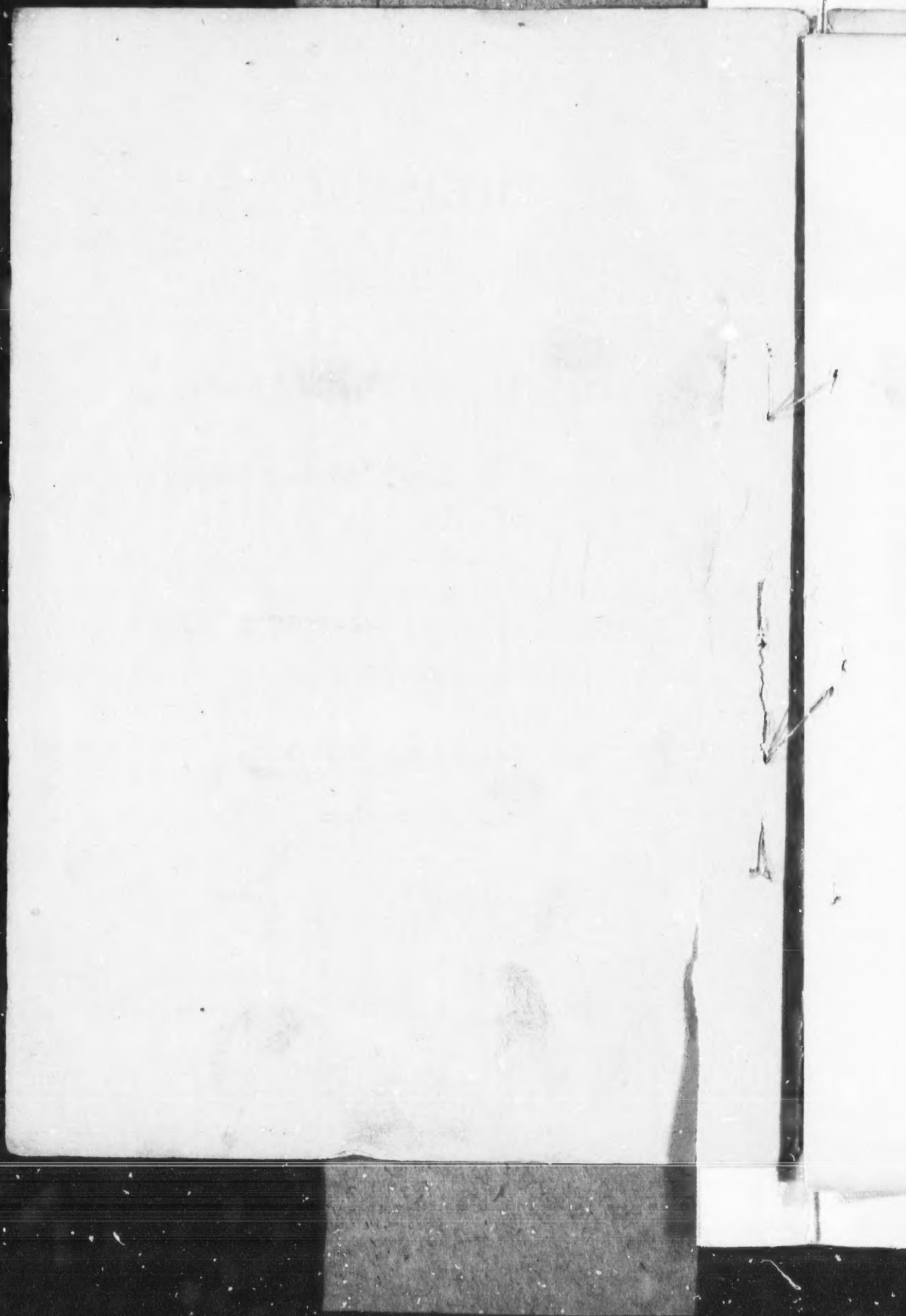




REPORT

OF

CHARLES W. FAIRBANKS,

Engineer of the Inland Navigation Company,

ADOPTED AT THE

ANNUAL GENERAL MEETING OF THE
COMPANY.

Held on the 4th April, 1855.

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June 10, 1806
James G. Thompson

**To the President, Directors and Shareholders of the
Inland Navigation Company.**

GENTLEMEN,—

ON the Eighteenth of June, 1854, operations to construct a Canal or Inland Navigation from the Harbour of Halifax to the Basin of Minas, were re-commenced, an interval of twenty-two years having elapsed since the same works were in progress under the direction of the Shubenacadie Canal Company. As all the works now executed, or in process of being formed, have been built by men under my immediate orders, I shall detail what has been done, beginning at the Grand Lake, and describe the various works which intervene between it and the Harbour of Halifax. At the South end or head of the Grand Lake, the old Canal Company had erected a Lock and Dam, which were intended to enable Vessels to pass up into Fletcher's Lake, the height or rise to be overcome being about ten feet. The Lock was built of stone, and the Dam is an extensive work. On examination of this Lock it was found so imperfect as to require to be re-built. The Dam was also very defective. This Lock is built on solid slate rock; I have taken down all the old masonry, excavated and levelled the rock to make a sure and good foundation for the new work, re-built the chamber walls about one-third their full

height. This portion of the work is under the level of the water in the Grand Lake. The water was pumped off, a Coffor Dam being placed on the Lake side of the Lock, the chamber walls are seven feet thick and are built with great care, the cement used came from the Rosendale Cement Works, New York. All the masonry is laid with Hydraulic Cement: no Lime will be used except for the back part of the walls, above the water line in the Canal. The stone in the old Lock not being of proper dimensions, I opened a Granite Quarry on the West side of Fletcher's Lake in the Winter, and obtained an ample supply of that valuable stone, not only for this Lock, but for all the works which may be required on the Canal; some of the stones now cut and ready to go into the walls of the Lock weigh two tons each. Sand of the best quality is to be got on the shores of the Grand Lake. The Iron Work for the Lock Gates is now ready for use. The Timber is on hand; in fact, the Iron and Timber for all the Locks on the Canal, from the Grand Lake to the Harbour, are already prepared.

The Dam at the head of the Grand Lake has been repaired; it was found to have been built in a most careless manner—numbers of old logs, trees, roots, and much rubbish have been removed from the foundation; a solid bank has been made faced on the upstream side with stone. To complete the works, at this point, the Lock Walls will be carried up ten feet above the proposed level of the Grand Lake at high water line; this will make the whole height of the chamber walls sixteen feet. The Locks on the Canal are all to be Seventeen Feet Four Inches wide at the bottom, and the walls have a batter of one half-inch to the foot. No side tunnels are to be used. The

Lower Gates are common Lock Gates, but the upper Gates are to be what is called the Hollow Breast Falling Gates—this being the latest improvement in Lock Gates. The length of all the Locks is to be sixty-six feet in the chamber, a waste Wear, capable of discharging all the water which may require to pass over it in the greatest freshet, will be placed in the Grand Lake Dam. Plank for this waste Wear and for the Gates, is engaged, and will soon be on the works. Sheds for the workmen, Blacksmiths' Shops, Tools of all kinds for the Stone Cutters, Masons, Blacksmiths, and Ship Carpenters are on hand at this point. This Lock is a convenient depot for all the work Northward. An examination of the works at the Grand Lake will convince any one that I wish to construct the work in the most solid and careful manner—equal, I think, to the best works on this continent. I should not have located the works at the Grand Lake, as they are now being built, had I been the Engineer in the first instance. Economy compels me to use the old works as far as it is prudent to do so. On the East side of the Grand Lake Lock is placed a Shipyard from which we can, at a short notice, launch a large Canal Boat, now nearly completed. Timber, &c., for another boat is now in the Yard. The Boat built is formed much like those now in use on the Mersey and Irwell Canal. It is to be sloop-rigged and the mast will be lower down, so as to permit the Boat to pass under the Railway and other Bridges, if not made with a draw in them. On the shores of the Grand Lake, I have now Timber enough, or nearly so, for the whole Canal—below as well as above the Grand Lake. I found no difficulty in obtaining the wood wanted for the Gates and Locks, although I could not get any one to contract to get it

for me, except at about four times its value ; but, thanks to Mr. Hugh Logan, the active foreman of the men engaged in cutting Timber, I have a large quantity on hand, and can obtain all I may want for this or any other work, of the best quality.

The Main Post Road to Truro has been raised in several places, so as to elevate it above the top water line of the Canal. These embankments have been made at Holland's Brook, on the East side of Fletcher's Lake, and at two places near Lake Thomas. The road leading to Sackville from Scott's, on the Truro road, I had embanked ; and, at this place, sustained on logs, as the former road was built on the top of a soft bog.

We now come to Fletcher's Lock ; here we have erected a Bridge to form a Road to the Lock, repaired the old Dam, put in a large sluice capable of draining Lakes Thomas and William, so as to permit the construction or repair of all the works between this point and Porto Bello or Marshall's. The old Lock, being built on Slate Rock, has been reduced in height, recoped and repaired, with the exception of the Fore Bay, which will be completed early this Summer. The Dam will be planked and a large waste Wear formed. This Lock is expected to answer our present wants ; but, should it be found defective, it can be re-built at a small cost--the Granite Quarry being near to it. It will have new Gates put in. It will be observed that, so soon as the Grand Lake and Fletcher's Lake Locks are finished, a navigation of Eighteen Miles will be completed, extending from the foot of the Grand Lake to Porto Bello. This part of the work will be put into use without delay, as some trade may, at once, be carried on, and the materials for the other portions of the work brought down. The channel of the river

above Fletcher's Lock has been deepened and made straight. This was a very important part of the work. We were enabled to finish the under water work, extending from Fletcher's Lock to the foot of the Inclined Plane at Marshall's, owing to the very favourable season. The want of men was very much felt. The Narrows at Scott's have been deepened, and numbers of large rocks blown up and removed from the channel. We now come to Porto Bello; here a very extensive and difficult excavation has been made to carry the level of Lake William up to the Inclined Plane. This cut is five hundred yards long, twenty-five feet wide at the bottom, with slopes two to one. The material removed consisted of hard gravel, large rock, and mud. The Inclined Plane is graded and is ready for the rails. A strong and solid Dam has been perfected which retains the water of Lake Charles. The old Lock is used as a waste Wear, when it is required to send the water of Lake Charles Northward, so that repairs may be made at the works at Port Wallace. The Post Road has been embanked. The Porto Bello Inclined Plane will be about six hundred feet in length, and overcomes a height of thirty-five feet. The roadway is very solid, and the Dam here and at Fletcher's was proved by the very violent freshets, last Fall; with the exception of the breakage of a small sluice, no injury was sustained on any part of the Canal. We have a large quantity of stone cut and uncut at Porto Bello, which may be sold or taken to re-build the Locks at Port Wallace. The old Company spent £15,000 at this place. Lake Charles is the summit level of the Canal, and its water will supply the machinery to raise the Boats from Lake William, and also the Locks at the head of the Dartmouth Lake, it will be used too as

a reservoir for the Mills at Dartmouth. The Dam at Porto Bello is designed to retain the water of Lake Charles about two feet above the water line of the Canal; this extra space will contain the freshet water which may flow from Lake Loon and Cranberry Lake. I entertain no doubt but that we shall have plenty of water, not only for Canal use, but also for water powers. Should, hereafter, more water be demanded, Spider Lake, containing about 200 acres, and elevated 184 feet above Lake Charles, may, by a short cut, be turned into Lake Charles. A large reservoir may also be constructed on the Company's land on Lake Loon run. I would observe that I have not only tried to build you a Canal, but also form a number of water powers at the Locks. All the water between Dartmouth Cove and Porto Bello, not required to work the Plane at Marshall's, will flow into Dartmouth Cove. I hope to see this valuable stream turning, on its way to the Harbour, the water wheels of many useful Factories. The quantity of water discharged from Dartmouth Lake exceeds my former calculations; night and day, the water flows—no care is taken to preserve it.

At Port Wallace, one of the two old Locks has been taken down, and all the stone fit for use re-cut, the channel in the deep cut has been cleared out, the stones taken out of it have been built in a kind of retaining wall on the top of which a tow path is made. It is hoped that the other Lock will, with some repair, answer our purpose, as it was not built by contract, and is founded on the solid slate rock. I have a quantity of Timber ready to form the bottom of the other or upper Lock, in case it is found too expensive to base it altogether on the rock. The work remaining to be done at this point will be to re-build the Lock or

Locks, and to finish the channel in the deep cut, with a Guard Gate, at the South end of Lake Charles. We have now arrived at Dartmouth.

The work done has been the cutting and removal of a large mass of stone up to the Lock at the foot of Dartmouth Lake. As the proposed position of the new Lock, at the Dartmouth Lake, will require its location on a clay foundation, a lot of Timber has been passed through the Canal and is now ready for use in the foundation. The fact that Timber has already passed through 14 miles of the Canal, is some proof of its present utility.

The Canal Basin, above the large circular Dam, was filled with water, last Fall; the Dam retains the water, and I do not doubt but that, with some repair to the sluices, it will answer the purpose for which it was intended. From the Circular Dam an Inclined Plane or Railway, about 1,500 feet in length, has to be made to pass the Boats into the Harbour at Dartmouth Cove; the principal cost here will be the expense to be incurred for the rails, wire, rope and water-wheel to work the Incline. The grading of the Plane is not a very expensive matter, and can be made very solid and perfect. The Company own at Dartmouth a large and valuable property; the Grist Mill is rented to Messrs. White & Co.; there are several tenements under rent; the Cove gives some small revenue as a place for small vessels to winter in. On the West side of the Cove are several Lots of Land, lately used for ship-building purposes; these Lots will increase in value as the facilities for obtaining ship timber, *via* the Canal, extend. The most valuable property in Dartmouth is the water power of the stream descending from the Dartmouth Lakes, here-

after to be increased in value by the addition of all the water which now drains into Cranberry Lake, Lake Loon and Lake Charles, and, if required, Spider Lake. These water powers can now be leased or rented, and should yield a large revenue. Water powers can also be leased at Fletcher's Lock and at the Grand Lake Lock, so soon as the work at these points is finished.

Nothing has as yet been done towards the improvement of the Shubenacadie River, beyond preparing a large quantity of Timber for the Wooden Locks, proposed to be placed to avoid the rapids on the river. From the examination I have made, there appears less difficulty in making a good navigation in the river than was at first supposed. The Company own two Lots of Land in the County of Halifax, and a large Lot in Hants County ; one lot contains 2,800 acres and is distant from Dartmouth about 25 miles by the post road, it fronts on the river 160 chains or two miles, extending back two miles and thirty chains ; another Lot is one mile Eastward of the river and contains 1,200 acres. The Lot in Hants County is two miles and a half Westward of the river ; it contains 3,123 acres of very valuable land. These lots, if divided into small lots and sold, would yield a large sum, but the Company should not be in any hurry to dispose of their lands, or water powers at some points, for every day adds to their value. The Company also hold a number of small lots on which the Canal works are located. I would propose that the Company finish, without delay, the Locks and other works at the Grand Lake, Fletcher's and Porto Bello ; we would then have 21 miles of navigation in use which would give a revenue from the large quantity of logs, masts, spars, cord wood, &c., which would come down to the South end

of Lake Charles ; the remaining distance of two and a half miles to the Dartmouth Cove could be used in an unfinished state, it being all down hill into the Dartmouth Lakes, where much of the productions of the forest would be deposited for sale or use.

At the present high rate of labor and materials it will cost, as near as I can estimate, £150 for the waste Wear and £350 for the Grand Lake Lock, £200 for Fletcher's Lock, £2,500 for the Inclined Plane at Porto Bello, £800 will put the Port Wallace Locks and deep cut in working order, £3,500 should construct the Inclined Plane at Dartmouth and finish the Lock. This increased cost of the work Southward of the Grand Lake is due to the high rate of labor and materials, and from the manner in which the old Canal works were constructed, compelling me to re-construct over again a large quantity of work, which, I had supposed, would answer for the new works. It has also been considered proper greatly to improve the design and workmanship of all the works ; in fact, we are making a far superior work than at first contemplated, induced to do so from the belief that the advantages to be derived from it demand the most careful and solid construction. We have a large quantity of tools, required in making a Canal, and a Forge and Carpenter Shop in Dartmouth. The sale of the land, not wanted for Canal purposes, and the proceeds from the sale of stone and tools, when the work is finished, will re-pay a large portion of the outlay. A large portion of the work done by the old Company is available and valuable in the present work.

I have to thank your President, Directors and Secretary for their personal kindness, and the assistance they have, at all times, given me.

The workmen, in every branch of the work, have been remarkable for their good conduct; only one man has been injured. I do believe that every one connected with the work has tried to do his duty; all the overseers of the working parties are young and active men, and have evinced a desire to advance the work. My assistant, Mr. McDougall, has done all in his power to aid me; by him many useful surveys and lines of level have been made. For myself, I can say that I have used every effort to bring to a successful completion, the important provincial enterprise of which I have the honour to be the Chief Engineer, and, should I continue to be your Engineer, I trust that the day is not distant when the waters of Chebucto Harbour will be united, by an Inland Navigation, to those of Cobequid Bay, as creditable to your enterprise as it will be valuable to the whole Province.

I am, &c , &c , servant,

CHARLES W. FAIRBANKS, C.E.

Halifax, April 4th, 1855.

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